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Electronic Imaging Report

U.S. Department of the Interior
Bureau of Land Management
January 1994

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Executive Summary

During the latter half of 1993, the Bureau of Land Management (BLM) established a team to review the agency's present electronic imaging applications and to prepare a report describing important findings and recommended guidance.

To initiate the study process and familiarize the team with key issues relating to operational implementation of electronic imaging, the Eastern States GLO Project and the Nevada Mining Claims Conversion Project were analyzed by members of the team. As support for the study, a contractor provided the team with a written assessment of imaging technical issues.

There are a significant number of lessons to be learned from analysis of the two major operational projects. Among the most important of the lessons is the requirement to perform a complete job analysis prior to initiating a project to ensure that all components of the particular process or requirement are clearly understood and considered. The sponsor or manager of an imaging project must anticipate and plan for changes in hardware, software, and user requirements during the life of the project. Future projects should minimize the use of proprietary systems and closed architecture hardware to the maximum extent possible. Project managers must plan for a significant document preparation workload prior to scanning and implement rigorous quality control for each component of the project.

Recommended guidance is provided in terms of project management, standards, legal requirements, and acquisition strategies. Existing BLM project management policies and procedures should be followed for future electronic imaging applications. Guidance is provided concerning critical project initiation and development phases. The development of standards for the various phases of electronic imaging (capture, indexing, data compression and decompression, data exchange, storage, and display) are described. The team believes strongly that one of the keys to successfully designing and implementing future electronic imaging applications is access to systems integration skills. For future applications, it may be possible and advisable to obtain these type of integration services from the BLM modernization contractor. However, there are other options.

Several nearterm action items are proposed. Information exchange must be enhanced to ensure project managers and sponsors have critical information available to them. Opportunities to further implement the operational use of CD-ROM technology within all offices must be fully explored. The team did not attempt to define all potential future BLM applications for imaging technology. However, several nearterm applications are identified that the team felt could be positively impacted by implementation of electronic imaging technology.

Report: Electronic Imaging

I. Background & Introduction

Electronic imaging allows the automated capture and retrieval of paper documents alongside information in automated databases. Savings in document storage cost, restoration, access, and retrieval time can be significant. However, full utilization of this technology by the BLM will require a careful analysis of requirements, including potential re-engineering of work processes to take full advantage of the many benefits of imaging. Several of the BLM's offices have undertaken electronic imaging applications. In January 1993, the Washington Office Division of Information Resources Management (IRM) developed an Issue Paper for IRMAC (IRM Advisory Committee) deliberation which included an informal survey of current and potential applications. The two most prominent present applications are the General Land Office (GLO) Records Project managed by Eastern States (ES) and the Mining Claims Conversion Project managed by the Nevada State Office (NSO).

At the request of the IRMRC (IRM Review Council), the Service Center issued a call for nominations last summer to serve on a BLM Imaging Study Team. The team represented a broad spectrum of functional areas. A list of the team members is included in the Appendix to this report.

SCOPE

The topic of electronic imaging covers a vast array of issues. In order to prepare a report that is truly relevant to IRMRC deliberations, the team had to carefully identify the scope of its efforts. The team chose to concentrate on the following areas:

1. Review the present major applications of electronic imaging within the BLM (Nevada Mining Claims Conversion and Eastern States GLO projects) and identify the lessons-learned from these efforts that may impact future BLM electronic imaging implementations.

2. Evaluate the Automated Lands and Minerals Records System (ALMRS)/Modernization contract capabilities and determine the opportunities for electronic imaging applications.

3. Assess the development of imaging standards within the industry.

4. Recommend BLM guidelines to be followed agencywide to obtain management consideration/approval of requests for future imaging projects. These guidelines will follow BLM Automation/Information Resource Management/Modernization (AIM) and Life Cycle Management (LCM) policies.

5. Identify and describe major nearterm potential applications (1–3 years) that appear feasible and that would have a positive impact on the business of the BLM. Given the fact that potential applications of imaging could impact nearly all programs, the team made no attempt to define the full range of potential applications for this type of technology.

II. Analysis Process

To initiate the study process and familiarize the team with key issues relating to operational implementation of electronic imaging within the BLM, the GLO Records Project and the Mining Claims Conversion Project were visited by members of the team during September 1993. As requested, the team visiting Nevada also made some recommendations concerning this project to the Nevada State Director.

To assist the team, a contractor was tasked by the team leader to provide BLM with a written assessment of electronic imaging technology via literature review and professional knowledge/experience. This report included an assessment of the direction of this technology, a description of future technological milestones that can be anticipated, an update on imaging standards development (potential impact on BLM applications), and relevant case studies from within the government and the private sector. This report was available to the BLM team in mid-October and is included in the Appendix as a reference document.

During October the full team assembled in Denver to discuss and refine the study parameters, outline the format for the report, and initiate drafting of the document. During this meeting, the team was briefed by a member of the ALMRS/Modernization Project Office concerning imaging-related issues associated with the modernization contract. After the meeting, smaller groups continued preparation of segments of the draft document via networking with each other from their home offices. The report was then finalized for preparation to the IRMRC in January 1994.

In the following sections of this report, the team lists our Findings resulting from the onsite visits, offers Recommended Guidelines for the evaluation of future electronic imaging projects/implementations, and suggests Nearterm Action Items.

Two documents included in the Appendix contain a significant amount of relevant technical information. The team feels that this information is a critical component of this report and urges that this material be carefully reviewed. Additional references are listed in the Bibliography. References available through the BLM Library at the Service Center are tagged with an asterisk.

III. Findings

As a result of the team's review of the imaging projects in ES and NSO, the team identified some key lessons that other BLM offices should consider when developing proposals that include imaging technology:

- Do a full Job Analysis, as part of the AIM/LCM project design, before you start. See Section IV of this report for a more thorough description of the steps involved in a Job Analysis. Follow the BLM AIM project management process to the letter.
- An imaging application typically involves repetitive job steps in a routine sequence—a production line process. It is important to project success to involve the day-to-day "doers" on the production line as well as the "customers" who must access images and data in the design of the process. They will have great ideas for improving efficiency of the process.
- Networking: The team discovered many imaging projects outside of BLM and outside the Federal sector. There are lessons from these projects that drastically increase the chances for success of our own projects. These outside experiences may be well documented in the trade press and symposia proceedings. Several are summarized in the documents within the Appendix of this report. In developing new imaging proposals, proponents of future BLM projects must research these past efforts. Centralized maintenance of an up-to-date listing of imaging projects (planned as well as implemented) is essential to the evaluation process. (See the Nearterm Action Items section of this report.)
- Expect to define both the minute details of the process as well as the major goals and objectives. This is the step for incorporating Government re-engineering into systems design and implementation. Be concise in specifying requirements; no step or procedure should be considered unimportant.
- Expect and plan for funding and implementation of many changes in hardware, software, and user requirements during both the initiation and operational phases. In other words, even in the best designed process and work flow, plan for change!
- All future projects should make every effort to minimize use of proprietary software and closed architecture hardware. Conversely, all projects should maximize use of commercial off-the-shelf or public domain software and open architecture hardware. The team notes however that it may be necessary for some components of an imaging project to utilize proprietary products and customized software prepared by a Systems Integrator.

- Because imaging projects will be "custom designed" production lines, every Project Manager must ensure that all work flows and procedures are thoroughly documented. Rigorous attention must be given to documenting all changes to standard operating procedures. The test of documentation is whether a new person on the line can read the user manual and then perform the procedure correctly.
- Expect to prototype and test new procedures before they are widely adopted.
- Train for depth of knowledge. In other words, cross-train so that more than one person knows the details of discrete steps in the production process.
- Plan for significant effort in document preparation prior to scanning. Images of blank and duplicate pages occupy valuable space on costly optical platters. Scanning time is more effectively utilized when the operator is not continuously checking documents for sequence and orientation within a batch. "Dog-eared" pages or files that contain clips, notes, or staples must be fixed. Depending on the nature of the documents, the document preparation process may consume from 10-25 percent of project time.
- Plan for rigorous quality control of each component of the project. Quality assurance should not be limited to either the scanning or indexing operations.
- Many imaging projects will involve using a Local Area Network (LAN) to move images and associated attribute data through the process. Images are data intensive and even a moderate volume of image traffic on a LAN can significantly reduce overall LAN performance. Therefore, give serious consideration to an isolated LAN for larger imaging projects.
- Insure that the Project Manager has sufficient resources and discretion to be principally dedicated to project overview, rather than be a production line person.

Another major item of the team's discussion and investigation was the question of what imaging-related hardware the Bureau can acquire under the recently awarded modernization contract. We found the following:

- When the contract was advertised for bid, requirements for complete imaging hardware/software packages were not included. Nevertheless, the contract does include three levels of document scanners, ranging from page size to map size, with costs ranging from about $3500 to $200,000. Scanning resolution of this equipment is high, with options for the user to set lower resolutions. Document thruput speed is relatively slow.

- Also available on the contract are two levels of optical disk jukeboxes for CD-ROMs, but the team expects that these devices will not provide sufficient storage space for the large files associated with a typical imaging project.
- The above items may fulfill some imaging needs; however, it is anticipated that most of the future imaging projects may need to procure some of the equipment outside of the modernization contract. (See the Recommended Guidelines section of the report for a discussion of system integration and acquisition issues.)

IV. Recommended Guidelines

PROJECT MANAGEMENT

To keep organizations efficient, managers know they must increase productivity. Cost effective information management thus becomes key to maintaining and improving productivity. Over the last few years, increased interest has focused on electronic document imaging (EDI) and electronic image management (EIM) as having the potential to automate numerous manually performed tasks and to potentially accomplish these tasks faster and with fewer errors.

Basically, the electronic imaging process converts paper and microform (microfilm, microfiche, aperture cards, etc..) documents (through the use of a scanning device) and already existing electronic data into electronic images. From these images, electronic documents can be printed, faxed, or retrieved for processing or viewing. The primary goal of document storage and retrieval is common to all such imaging systems, but the methods vary considerably. The most elemental electronic imaging systems focus primarily on document storage and retrieval and document processing.

It is not difficult to predict that the use of imaging will soon become widespread as the technology matures and as its associated costs decrease over time. But in what way could or should the BLM utilize this emerging technology? In the process of trying to answer this question there are a number of considerations the BLM must keep in mind. The AIM/LCM process (BLM Manual 1261) must be used when evaluating potential future imaging applications.

This section will look primarily at the first two phases of the AIM/LCM process, the Initiation Phase and the Development Phase. The knowledge gained from these two phases will assist BLM management determine if a particular potential imaging project is a "go/no go" for the Bureau.

When considering whether to use imaging the following items should be addressed :

Initiation Phase

1. Know your current systems (storage and retrieval)
2. Understand EIM's strengths and weaknesses
3. Know your current documents
4. Form a Task Force

Development Phase

5. Develop a Model
6. Create a Workflow Chart
7. Design an Index Database

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1 **Know your current systems (storage and retrieval).** Records management is a complex activity, requiring diligent and structured efforts to maintain. Before the BLM can effectively implement a new EIM records system, it must first completely understand how its current records system functions and how its end users presently work within that system. What characteristics of the storage environment and the rate of data retrieval are important for the effective everyday functioning of the BLM? What costs is the BLM willing to incur to implement its various options?

A sound records management program must satisfy the requirements of a diverse constituency. Numerous economic, operational, and regulatory issues must be considered and evaluated. The organization's functional and operational needs must be met, its history must be preserved, its vital interests must be protected, and its records must demonstrate regulatory compliance and legal admissibility.

Successful records programs, regardless of storage media and regardless of type of business, must meet the following common requirements:

a Generate records and program management documents in the regular course of business.

b Create records, processes and documentation with predictable frequency.

c Create and maintain documentation in such a way that it provides and maintains a complete and accurate audit trail.

d Individuals with knowledge of the activity, process or event recorded are the ones who create the records.

e Record or capture record information at the time of the event.

2 **Understand imaging's strengths and weaknesses.** Electronic imaging has the potential to greatly streamline, automate, and accelerate information-processing tasks for numerous BLM applications, however, the up-front cost and the ongoing management effort of electronic systems are considerably greater than those for maintaining or developing paper and microform systems. Imaging conversion should, therefore, occur only with those documents which have the attributes and characteristics that justify the expense and effort of EIM conversion and maintenance. A detailed benefit/cost analysis (B/CA) will provide the BLM with a better idea of imaging's feasibility for its potential applications and will help the BLM to determine the appropriate technology mix to meet its current and future requirements.

3 **Know your current documents.** Determine which documents are appropriate for imaging conversion. What factors should be used to select documents for conversion to digital imaging (not all documents are appropriate candidates)? The most relevant factors in the decision go beyond the choice of technology or the purchase price. Electronic document imaging should address a genuine need.

It is usually not economical to convert inactive records to electronic media. Often only relatively active records in the "backfile" warrant conversion; the remaining records may continue to be used in their original form. Use of unconverted records will generally continue to decline as the records age.

Should the original source documents be kept? Address this issue by studying the legal, operational, and statutory implications of disposing of records. Discriminate between original records and official records and copies because originals may be needed for legal purposes under unique circumstances.

Perhaps the single-most important factor governing whether or not to convert paper records to electronic media is your user group. Consider the number of users, frequency of retrieval, duration of use, need for simultaneous use, and access costs. When high-retrieval activity, simultaneous access, or distributed access is required, electronic media can be very effective.

4 **Form a Task Force.** Project Managers, as part of the AIM process, need to find people who have an interest in the project and have had prior experience in EIM, or who are willing to learn some technical material that may be outside of their primary work focus (managers, users, LAN specialists, etc...). Give assignments to the participants based both on their previous experience and on their desire to explore new territory. Ask the following questions:

- **a** Is BLM really doing the best it can with its present resources?
- **b** What precise goals does the BLM expect to accomplish with a successful imaging system installation?
- **c** What are BLM's expectations for the EIM system's performance?
- **d** Do these expectations address the problems of BLM's current information retrieval and storage methods?
- **e** Can BLM quantify these expectations in terms of actual EIM system functions?

The task force will perform the requirements analysis and examine the document collections to determine if they are candidates for conversion to electronic images. This includes the preparation of a benefits/cost analysis and the completion of a records transition plan.

5 **Develop a Model.** Analyze workstation and storage configuration. Further refine the benefits/cost analysis (Pre-purchase study, system purchase, conversion, training, maintenance and upgrades) of an EIM system to bring the BLM a reasonable return in terms of labor and space savings, increased service, and/or new opportunities for generating revenue.

6 **Create a Workflow Chart.** This is used as the basis for the index database. Workflow is the organized movement and processing of information to perform specific functions. A well developed workflow component not only streamlines many manual processes, but routinely generates the management reports that make further fine tuning possible without additional surveys and studies.

7 **Design Index Database.** The index Data Base Management System (DBMS) is the heart of an EIM system. First determine what search fields will be needed, how information will be extracted from the images to populate the indexing fields, how the indexed information will be quality assured, how the documents will be added after the initial conversion, who will be allowed access to the system for update purposes, which customers will have read-only access, how the system will handle priority retrievals requests, and how the system will block entrance to files with security protection. Maintain maximum compatibility with existing related databases. Use the results of the document survey and retrieval studies to establish the database search fields and structure to organize documents into established record groups.

   The index database and retrieval screens can be customized to reflect the BLM's diverse user community by establishing categories that reflect how each user retrieves documents. Securities can also be established to protect the database integrity.

If after following the items mentioned above it is determined that the BLM could benefit from a particular imaging application the AIM/LCM process would proceed to the remaining stages within the Development Phase and on to the Operation & Maintenance Phase.

STANDARDS

Imaging encompasses much more than just scanning and converting documents; it includes almost all disciplines related to computing. Standards are as critical to site or state specific applications as they are to Bureauwide applications.

Some standards are identified by the proposing office at the time the project is being developed, i.e., document handling, scanning requirements. Other standards, such as hardware/software, may be imposed by existing applications with which images and data would be shared.

Standards must be in place to ensure that image data can always be accessed and displayed to its maximum desired quality and in the most efficient manner. To date, neither the imaging industry nor the Government have adopted universal standards for imaging compression/decompression/display. The Association for Information and Image Management (AIIM) continues to lead the development of such standards. BLM must ensure that it keeps fully informed concerning these activities.

Specific document imaging standards that must be carefully considered include:

1 **Document preparation, capture and indexing:** Document conversion, image quality, handling, security, scanning parameters and equipment, and indexing.

Of all the elements in electronic imaging systems, document preparation is the least talked about, and always the most underestimated. Document preparation can be tedious, but is critical to the quality and acceptability of the entire project. The preparation is nearly identical to the process followed when preparing documents to be microfilmed.

Preparation can include determining to what degree the document image needs to be legible – what type of enhancements are acceptable (i.e., footnotes, margin notations, electronic enhancement). When using electronic enhancements careful consideration must be given to increased storage requirements.

The quality or resolution of a scanned image is measured in pixels per inch or dots per inch. Normally, there is flexibility in determining resolution, and generally, the higher the resolution the better the quality. As image quality and number of pixels increase, scanning speed is reduced and storage space increases.

Standards must be established and documented as to identification of documents to be scanned. In a given application is it necessary to capture canceled or incomplete pages/documents?

Without effective indexes, imaging systems are virtually useless. Only through the index can documents be located, selected, and retrieved for viewing and copying; therefore, the design and accuracy of the indexing system is very important. Accuracy in indexing is very significant; the fewer the number of fields available for querying and retrieving a document, the more critical an indexing error becomes. Several quality control techniques can be implemented, and edit features can also be built into the system software to reduce errors.

Sampling procedures and acceptance/rejection standards need to be developed to test all aspects of the system - hardware,

software, indexing, and quality of images. Quality control of scanned images and indexed information is extremely important to the overall success/acceptability of the project.

2 **Document compressions and decompression:** Standard headers to ensure transportability and better compression and decompression schemes for a wide range of image types and display options, and user guidelines.

Electronic imaging requires huge amounts of data storage and each degree of compression obtained represents money saved.

Generally, the compression method and image file format used in a given imaging system will be determined by the applications software used to capture and store the images. This aspect of imaging software is an important factor when designing the process. The compression technique used on a set of images will not only affect their storage size, but the accessibility and portability for the life of the project.

While no universal standard has been adopted by the Government, BLM managers should ensure that the format and compression method used by the products they purchase are open and usable by future users of the data. One way to ensure this forward compatibility is the use of software compression techniques (versus hardware based methods) because software is easier to duplicate by others, especially on divergent computer platforms.

3 **Document transmission and exchange:** Standard image system architecture, folder interchange, application profiles, equipment interfaces.

Standard and non-proprietary software should be used to the maximum extent possible. Not only can this simplify data sharing/exchange, but it provides a window for customizing software to fit specific project needs.

The scope of the project may dictate the attributes necessary for transferring image and multimedia files, of which compatibility should be an important factor.

Imaging transmissions are significantly larger than normal data transmissions, even after compression. Consequently, there is a greater demand on data buses and data links; therefore, networks may be overwhelmed. If the intent is to network an imaging system, it is necessary to evaluate the impact imaging will have on an existing network and weigh alternatives. The GLO Records Project has minimized network traffic congestion by installing a dedicated LAN, maintaining the document conversion process separate from the document retrieval process within the same LAN. Local optical drives are utilized for imaging and quality assurance while optical jukeboxes serve customer retrieval needs.

4 **Document access and storage:** Standards on labeling, LCM, life expectancy, legality and monitoring methods.

Typically, hardware life is 5 to 6 years; data life may be 100 years, if stored on the appropriate media. To manage document imaging applications, you must be able to migrate data and refresh files. Consideration must also be given to the National Archives and Records Administration (NARA) standards/ requirements for disposal of archivable records. We need to ensure that the archival information which is created today, and which in theory will last for 20 to 30 or more years can still be read in the future when we may not even be using optical disks.

Each aspect of an imaging system must be evaluated to ensure proper security and user restrictions. Certain uses may be password protected, or audit trails may need to be built in to track system usage. User "Parms" tables can be utilized to grant privileges and to control access to each component of the records automation process. Retrieval software tracks access and provides the audit trail for cost recovery. Security measures, such as storing duplicate copies of the media and index off site, may be necessary.

5 **Document delivery, printing and display:** Standards on interfacing and equipment specifications.

If the media is being shared with external users, current cost recovery guidelines may apply. If no applicable cost recovery guidelines exist, an analysis must be performed to determine appropriate charges for the services provided.

Printer capabilities should be equivalent to the quality (resolutions) of the scanned image, ensuring that a copy of the document can be produced at a resolution compatible to that of the scanned image. The same standards would not necessarily hold true for display/retrieval stations.

LEGAL REQUIREMENTS FOR OPTICAL DISK RECORDS AND ELECTRONIC IMAGING SYSTEMS

Vendors and potential users have expressed concern about the legality of records maintained with optical disk technology, including specifically the admissibility of these records as evidence in court and their acceptance by government agencies. The courts have not yet offered the definitive judgement concerning the legal admissability of this data.

Those using electronic imaging systems should carefully establish and follow procedures designed to ensure the trustworthiness of the image information and provide a detailed audit trail. The benefits of this new technology can be capitalized upon if the system is properly designed and implemented to meet the anticipated legal requirements of tomorrow.

Optical disk technology is a duplication technology similar to photocopies, microfilm and facsimile. The best-known reproduction techniques (photocopy, microfilm, facsimile and electronic image management or optical disk) exhibit the same three characteristics.

1. **Image Capture.** A photograph, scan or other process to identify and capture the image of the original document.
2. **Image Manipulation.** A photographic, electronic, photostatic or other process that transforms the captured image into a format for storing and reproducing the image.
3. **Visible reproduction.** A photographic, photostatic, printing, or other process that converts the manipulated image into visible form.

An optical disk system utilizes an electronic scanner for image generation; computer software, memory and optical disk storage for image manipulation and graphic terminals and laser printers to make the image visible. An optical disk system is therefore similar to other reproduction technologies. As long as the final reproduced image "accurately reproduces the original without alteration," it appears that the law of evidence in the United States would allow the visible records produced by this technology to be admissible in evidence.

In the United States, two uniform laws clearly establish the basis for admitting records maintained on optical disk systems into evidence: The Uniform Rules of Evidence and The Uniform Photographic Copies of Business and Public Records as Evidence Act (UPA). Both laws would admit duplicate records into evidence if they **accurately reproduce the original.** Forty four states have either adopted the UPA or the Uniform Rules of Evidence.

The acceptance of this new technology depends upon the comfort level of the judges and administrators. Several hundreds of years were required for the courts to accept paper records as evidence, approximately 40 years to accept microfilm, and approximately 10 years to accept computer records. A few more years may be required for the courts to accept electronic imaging systems and digitized records.

It should be noted that in the recent King and Denny trials in Los Angeles, the court did not hesitate to admit video tape as evidence. Optical disks and video tape are both examples of storage of electronic data. Therefore it is highly doubtful a court would find information stored on optical disk inadmissable as long as the process used to generate the disk was controlled.

1 **Systems integration:** In the absence of a "pre-packaged" imaging system, a Project Manager must rely on either BLM expertise or the services of a contracted systems integrator to match project requirement definitions to available imaging components. The importance of competent systems integration to the success of an automation project cannot be overemphasized. Both the GLO and the Nevada mining claims conversion projects utilize these type of skills.

Access to a contracted systems integrator can be obtained through various procurement vehicles. The BLM modernization contract contains the following language:

"At the option of the Government, the Contractor shall provide engineering support, as may be required for critical mission functions not included in the IOC" (refer to Section C.1 Scope and Overview of that contract).

It appears that use of the modernization vendor, via initiation of a task order, may be a viable option to meet some of the BLM future imaging requirements.

Other vendors providing such services may be obtained through Requests For Proposals (RFPs) or Memoranda of Understanding (MOUs) with Federal and State agencies enabled to act as "technology brokers" for vendors located within given regions. The systems integrator is usually responsible for "customizing" the available components to meet the requirements definitions as specified for the project.

2 **Hardware/firmware/software:** Hardware/firmware/software components of an imaging system may be procured from various sources. Workstations and servers listed on the BLM modernization contract may be suitable for Bureau imaging applications. While not tasked to provide complex imaging systems within the terms of the modernization contract, the contract may have viable solutions to offer. Both Eastern States and Nevada State Office plan to test the compatibility of the UNIX workstations with each project's imaging video board/software as equipment becomes available.

Until Government/industry imaging standards are adopted, proposed imaging applications must continue to contend with the proprietary vs. open-architecture issue. Each application should be judged on its own merit to provide the most beneficial imaging solution. However, particular emphasis must be placed on the need to share information with customers who may or may not have compatible imaging components. The continuing evolution of imaging technologies challenges BLM managers to investigate the numerous "packages" and design/procure the appropriate system to meet program requirements.

V. Nearterm Action Items

The team recommends that the following actions be initiated and/or investigated to enhance the knowledge base of electronic imaging and increase the opportunities for future successful applications of this technology within the BLM.

INFORMATION EXCHANGE

The Headquarters IRM staff should establish an Electronic Imaging Information Clearinghouse to facilitate the exchange of information pertaining to technical issues. This clearinghouse would primarily serve to assist future project advocates and program leaders during the project initiation and development phases of the AIM/LCM process. This clearinghouse function could encompass the following activities:

1. Maintain a current file of all BLM imaging project documents (feasibility studies, project plans, charters, progress reports, technical reports, etc.). This would include lists of procedural documentation manuals prepared in support of each project.

2. Via communication with Departmental IRM officials, maintain a similar file of related reports pertaining to imaging applications within other agencies or Departments.

3. Maintain current information pertaining to the development of standards relating to electronic imaging. At the national level, standards related to imaging are developed primarily by the following organizations:

   - Association for Image and Information Management (AIIM)
   - National Institute of Standards and Technology (NIST)
   - Institute for Electrical and Electronics Engineers (IEEE)

4. In FY-94, the National Archives and Records Administration (NARA) will publish a report entitled "Digital Imaging and Optical Digital Data Disk Storage Systems: Guidelines for Federal Agencies." This report will include input from fifteen agencies and information gathered from ten site visits. It is recommended that copies of reports such as this should be provided to all State Offices and Centers.

CD-ROM jukeboxes are available on the BLM modernization contract and can be installed along with the modernization equipment. Attaching a CD-ROM jukebox to a network server in each BLM facility can make vast amounts of resource and administrative information readily available to Bureau employees. Relevant examples include: the Federal Register, the Federal Personnel Manuals, U.S. Geological Survey water resources data, endangered species data, transportation infrastructure data and atlas information.

CD-ROMs may be procured individually or as subscription services, depending on the frequency of updates. By taking advantage of Bureauwide procurement initiatives, CD-ROMs could be acquired at the least possible cost to the Government.

A few BLM offices have purchased CD-ROM recorders, which provide the capability of producing a write-once CD-ROM. As an example, the GLO Records Project is utilizing such technology in conjunction with the U.S. Geological Survey's GSSearch retrieval software to distribute GLO attribute databases on a state-by-state basis. The CD-ROM premastering and reproduction is contracted through the Government Printing Office (GPO). The GLO CD-ROMs are then assigned a GPO publications stock number and become available for purchase at the cost of $15.00 per CD-ROM, substantially below the market rate of $90.00+.

Initial sales of the Arkansas CD-ROM are quite favorable, Louisiana and Florida CD-ROMs should be available in December. The GLO CD-ROM effort is applying the Administration's initiative to make Government data available to the general public at the least possible cost.

The same CD-ROM recording and distribution technology can be utilized by the Bureau for both internal and external distribution of other program databases. The GSSearch software, which is public domain, is a great tool for quality assuring multi-field databases.

It is important to restate that the team made no attempt to define all potential future BLM applications for imaging technology. The Johnson Controls report contained within the Appendix of this document describes several case studies which illustrate relevant applications. Imaging systems have already become so widespread in government that some experts say the technology will soon be absorbed into mainstream computing. Fully half of the respondents to a recent Government Computer News survey (October 1993) said records management was a significant use to which imaging is being applied. One-third of respondents listed archiving. Twenty nine percent indicated that imaging is being used in conjunction with geographic information systems or mapping. Thirty one percent listed engineering applications as a significant imaging application within their organizations.

Most of BLM's records are still on paper, some have been preserved on microfiche. These records clearly support field operations, assure administrative oversight, preserve the organization's history, and comply with regulatory and statutory requirements. Keeping records in a paper format may not be an efficient way for BLM to do business. There appears no doubt that within a few years, a majority of our current records management and transactional processes may be impacted by imaging technology.

The BLM Imaging Team has identified some nearterm applications that we feel could be positively impacted by implementation of imaging technology.

1. A significant effort has been underway for the past several years in the Eastern States Office to implement an imaging system for federal land patents. The primary purpose of this effort is to preserve and increase access to these valuable records. Due to the nature of the GLO binding process, over 1 million western land patents located at Eastern States will also be automated (representing the period from 1908-1960+). The results of this effort should be carefully analyzed to determine whether the remaining western land patent records should be incorporated into this same type of system.

2 Administrative support systems:

   a Correspondence management - Evaluate the Department of the Interior's (DOI) imaging system that tracks all incoming correspondence. It is our understanding that it has been implemented at the Executive Secretariat and Assistant Secretary level.

   b CD-ROM candidates - In addition to the tremendous amount of CD-ROM data presently available from other agencies and nonfederal sources, there appears to be a significant amount of BLM-generated information that are strong candidates for CD-ROM presentation. Examples include the Public Land Statistics, BLM manuals and technical handbooks, historical aerial photography, and archival records such as Instruction Memos (currently microfilmed on an annual basis). This data when presented in a CD-ROM format has great value for reference purposes both internally within the BLM and also to external entities.

3 Survey plats are large format drawings which depict the area included in a survey, such as a township, private land claim or mineral claim. The plat shows the direction and length of each line; the relation to the adjoining official surveys; the boundaries, descriptions, and area of each parcel of land subdivided; and, as nearly as may be practicable, a representation of the relief and improvements within the limits of the survey. Plat automation via an imaging system would enhance the efforts of the data collection and maintenance for the Geographic Coordinate Data Base (GCDB), serve as an additional tool in Information Resource Management, and provide supplemental data for Ecosystem Management.

   Eastern States is currently in the process of creating an attribute data base for survey plats in anticipation of future optical scanning. Their plat data base is compatible with established ALMRS/GCDB data elements. A similar data base for the survey plats in the Western States should be considered. It is also possible to image plats from microfilm (Western States plats) with technology currently available.

4 The team discussed the value of imaging Master Title Plats (MTPs). Some State Offices have or are currently investigating this application. Members of the team were concerned about the potential overlap between this type of effort and ALMRS goals and objectives.

Although implementation of ALMRS will bring forth the ability to automate the production and maintenance of MTPs, BLM may find value in imaging older MTPs as an archive of historical land status changes. Imaging could also have value in areas of special survey where GCDB may not be completed for some time. Since there are already some investigations by the States in this area, it is recommended that the Washington Office evaluate this requirement and be prepared to provide policy and guidance if warranted.

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* = BLM Library Resources

BLM Electronic Imaging Study Team

Fred Batson	Service Center (671), Lead
Ken Schauer	Colorado State Office (943)
Jim Gegen	Eastern States (932)
Terri Bakken	Montana State Office (954)
Wayne Lowman	Nevada State Office (940)
Jack Savlan	New Mexico State office (940)
Pat Geehan	Oregon State Office (920)
Kathy Speight	Washington Office (872)
Bob Gibson	Washington Office (660)
Betty Riley	Service Center (675)

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225